REMARKS

I. Status Summary

Claims 1-7, 11, 13, 15, 17-20, 23-25, 27-30, 33-44, 46-58, and 63-65 are pending in the present application and have been examined. Claims 1-7, 11, 13, 15, 17-20, 23-25, 27-30, 33-44, 46-58, and 63-65 presently stand rejected.

Claim 38 has been rejected under 35 U.S.C. § 112, second paragraph, upon the contention that the claim is indefinite due to its dependence from a canceled claim.

Claims 1-7, 11, 13, 15, 17-20, 23-25, 27-30, 33-44, 46-58, and 63-65 stand rejected under 35 U.S.C. § 103(a) upon the contention that the claims are unpatentable over published European Patent Application EP 989,579 to Bower *et al.* (hereinafter "Bower") in view of U.S. Patent No. 6,616,497 to Choi *et al.* (hereinafter "Choi").

Claims 1-7, 11, 13, 15, 17-20, 23-25, 27-30, 33-44, 46-58, and 63-65 have been rejected on the ground of nonstatutory obviousness-type double patenting upon the contention that the claims are unpatentable over claims 1-106 of U.S. Patent No. 7,252,749 (hereinafter "the '749 patent") in view of Choi.

By this amendment, claims 3-6, 25, 42, 55, 57 and 63-65 have been canceled and claims 1, 18, 27-29, 38, 40, 43, 44, 46 and 56 have been amended. Support for the amendments can be found throughout the specification as filed, and particularly for example at page 4, paragraph [0054]; page 5, paragraph [0067] through paragraph [0069]; page 6, paragraph [0077] through paragraph [0080]; and page 6,

paragraph [0086] through paragraph [0087] of U.S. Patent Application Publication No. 2004/0055892. No new matter has been added.

Therefore, upon entry of the amendment, claims 1-2, 7, 11, 13, 15, 17-20, 23, 24, 27-30, 33-41, 43-44, 46-54, 56 and 58 will be pending in the subject application.

II. Response to the Objection of Claim 38

Claim 38 has been rejected under 35 U.S.C. § 112, second paragraph, upon the contention that the claim is indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, the Examiner contends that claim 38 depends from a canceled claim and is therefore unclear and indefinite.

Applicants respectfully submit that claim 38 has been amended herein to now depend from claim 1. Accordingly, applicants respectfully submit that the instant rejection has been addressed and therefore respectfully request that it be withdrawn at this time.

III. Response to the Rejection of Claims Under 35 U.S.C. § 103(a)

Claims 1-7, 11, 13, 15, 17-20, 23-25, 27-30, 33-44, 46-58, and 63-65 stand rejected under 35 U.S.C. § 103(a) upon the contention that the claims are unpatentable over Bower in view of Choi. The Examiner asserts that Bower discloses the claimed method of electrophoretic deposition, but does not teach the use of a mask as claimed. However, Choi is relied upon for teaching the use of a

mask for patterned electrophoretic deposition and disclosure of the use of resists to form the mask. Therefore, the Examiner asserts that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Bower with the teachings of Choi.

The positions of the Examiner as summarized above with respect to the rejected claims are respectfully traversed as described below.

Initially, applicants respectfully submit that claims 3-6, 25, 42, 55, 57 and 63-65 have been canceled herein, thereby mooting this rejection as it pertains to these claims. Furthermore, without acquiescing to the contentions of the Patent Office, applicants respectfully submit that independent claims 1, 40 and 46 have been amended herein to more clearly recite the disclosed subject matter. Support for the amendments can be found throughout the specification as filed and particularly for example at page 4, paragraph [0054]; page 5, paragraph [0067] through paragraph [0069]; page 6, paragraph [0077] through paragraph [0080]; and page 6, paragraph [0086] through paragraph [0087] of U.S. Patent Application Publication No. 2004/0055892. No new matter has been added.

Applicants respectfully submit that the combination of references cited by the Patent Office does not support the instant 35 U.S.C. § 103(a) obviousness rejection because the combined prior art references do not teach or suggest all the claim features. The Examiner asserts that Choi teaches the use of a photoresist mask for patterned electrophoretic deposition. Therefore, the Examiner asserts that it would have been obvious to one of ordinary skill in the art at the time of the invention to

modify the teachings of Bower with the teachings of Choi to practice the claimed subject matter. However, applicants respectfully submit that neither Bower nor Choi, nor the proposed combination thereof, teach or suggest each and every element of independent claims 1, 40 and 46 as presently amended. In particular, applicants respectfully submit that the proposed combination of cited art does not teach or suggest methods capable of deposition of nanostructure-containing materials or methods of fabricating patterned electron field emission cathodes wherein the methods include, *inter alia*, adhesion promoting materials in an alcohol-based medium, an epoxy-based photoresist enabling patterned deposition, and an activation step.

Neither Bower nor Choi teach or suggest the use of an alcohol-based liquid medium in the formation of a suspension of pre-formed carbon nanotubes. Furthermore, neither Bower nor Choi, taken alone or in combination, teach or suggest the use of an epoxy-based photoresist as presently claimed. Additionally, applicants respectfully submit that the proposed combination of cited references also fails to teach or suggest an activation step comprising sonication, rubbing, tapping, brushing, blowing, plasma treatment, application of an electrical field in a vacuum, application of an electrical field under a partial oxygen pressure, or combinations thereof. Therefore, even assuming *arguendo* that one of ordinary skill in the art would be motivated to combine Bower and Choi, the resulting combination would not teach or suggest each and every element of the instant claims. Accordingly, given these deficiencies, applicants respectfully submit that one of ordinary skill in the art

would not consider the presently disclosed and claimed subject matter obvious over the proposed combination of Bower nor Choi.

Furthermore, applicants respectfully submit that it would not have been obvious to use an alcohol-based liquid medium and an epoxy-based photoresist, as presently claimed. In particular, an alcohol-based liquid medium enables the use of a high voltage electrical field in the electrophoretic deposition of the carbon nanotubes, whereas a water-based liquid medium would have decomposed under such conditions. An epoxy-based photoresist was used due to its insolubility in alcohol, whereas a soluble photoresist would have dissolved in alcohol. As such, it is respectfully submitted that the inclusion of an alcohol-based liquid medium in conjunction with an epoxy-based photoresist would not be obvious and is not taught or envisioned by the cited references.

Likewise, applicants respectfully submit that the activation step as presently claimed would not have been obvious to one of ordinary skill in the art at the time of the invention. The success of the activation step is dependent upon the nanotubes being strongly adhered to the substrate, a characteristic imparted, at least in part, by the inclusion of adhesion promoting materials, as presently claimed.

Continuing with the instant rejection, the Examiner contends that Choi teaches the use of a dielectric film to allow for patterned deposition and that the dielectric film is equivalent to the photoresist of the presently claimed subject matter. However, applicants respectfully submit that use of the dielectric film as taught by Choi is not tantamount to the patterning steps as presently claimed. To elaborate, part (ii) of

claim 1, recites, "depositing a release layer on the surface of the substrate, depositing a layer of epoxy-based photoresist on the release layer, masking the photoresist with a mask having openings which expose the underlying photoresist to UV light and forming a pattern of openings in the photoresist by UV photolithography". *See* also, page 6, paragraphs [0077] - [0080] of U.S. Patent Application Publication No. 2004/0055892. In marked contrast, Choi, at best, teaches a patterning step comprising a dielectric film formed with holes over the cathodes and metal gates having openings located over the holes in the dielectric film. *See*, column 3, lines 32-40, of Choi. However, this is not believed to be the equivalent of using a release layer in conjunction with a photoresist layer because nowhere does Choi teach or suggest the use of lithographic techniques to form a pattern in a photoresist layer. As such, the dielectric film of Choi is believed to be functionally distinct from the photoresist of the presently disclosed subject matter. Further, in some embodiments, the methods of Choi require a weak electrical field to be applied to the metal gate to prevent deposition of carbon nanotube particles on the gates. *See*, column 4, lines 33-59, of Choi. Neither the weak electrical field nor the metal gate is required in the presently claimed subject matter. Given these substantial differences, one of ordinary skill in the art would not equate the method of patterning taught by Choi with the photoresist techniques of the present claims.

Taken together, applicants respectfully submit that one of ordinary skill in the art would not consider the presently disclosed and claimed subject matter obvious over the proposed combination of Bower nor Choi. Furthermore, applicants

respectfully submit that the combination of references cited by the Patent Office does not support the instant 35 U.S.C. § 103(a) obviousness rejection because the combined prior art references do not teach or suggest all the claim limitations.

Accordingly, applicants respectfully submit that Bower and Choi, either alone or in combination, do not support a rejection of claims 1, 40 and 46. Therefore, applicants respectfully request that the rejection of claims 1, 40 and 46 under 35 U.S.C. § 103(a) over Bower and Choi be withdrawn and also request that claims 1, 40 and 46 be allowed at this time.

As each of claims 2, 7, 11, 13, 15, 17-20, 23, 24, 27-30, 33-39, 41-44 and 47-58 depend from claims 1, 40 and 46, they too are believed to be patentable over the proposed combination of cited art for at least the same reasons as discussed above. Thus, applicants submit that claims 2, 7, 11, 13, 15, 17-20, 23, 24, 27-30, 33-39, 41-44 and 47-58 are patentable over the combination of Bower and Choi. Therefore, applicants respectfully request that the rejection of claims 2, 7, 11, 13, 15, 17-20, 23, 24, 27-30, 33-39, 41-44 and 47-58 under 35 U.S.C. § 103(a) over Bower and Choi be withdrawn, and request that claims 2, 7, 11, 13, 15, 17-20, 23, 24, 27-30, 33-39, 41-44 and 47-58 be allowed at this time.

IV. Response to the Obviousness Type Double Patenting Rejection

Claims 1-7, 11, 13, 15, 17-20, 23-25, 27-30, 33-44, 46-58, and 63-65 have been rejected on the ground of nonstatutory obviousness-type double patenting upon the contention that the claims are unpatentable over claims 1-106 of the '749 patent

in view of Choi. While the Examiner concedes that the '749 patent fails to disclose the use of a photoresist layer as a mask, the Examiner asserts that Choi compensates for this deficiency by showing that it is known in the art to use a photoresist as a mask. In particular, the Examiner contends that it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the claimed invention of the '749 patent by applying a photoresist mask, as taught by Choi, to prevent the covered layers from being treated.

Applicants refer to the discussion hereinabove regarding the obviousness rejection under 35 U.S.C. § 103(a) over Bower and Choi. As applied in the instant rejection, applicants respectfully submit that one of ordinary skill in the art would not consider the presently disclosed and claimed subject matter obvious over the combined teachings of Choi and the '749 patent. In particular, applicants respectfully submit that neither the '749 patent nor Choi, nor the proposed combination thereof, teach or suggest each and every element of independent claims 1, 40 and 46, as amended herein.

Accordingly, applicants respectfully submit that the combined teachings of the '749 patent and Choi do not support a nonstatutory obviousness-type double patenting rejection of claims 1, 40 and 46. As such, applicants respectfully request that the nonstatutory obviousness-type double patenting rejection of claims 1, 40 and 46 be withdrawn, and request claims 1, 40 and 46 be allowed at this time.

As each of claims 2, 7, 11, 13, 15, 17-20, 23, 24, 27-30, 33-39, 41-44 and 47-58 depend from claims 1, 40 and 46, they too are believed to be patentable over the

proposed combination of cited art for at least the same reasons as discussed above. Thus, applicants submit that claims 2, 7, 11, 13, 15, 17-20, 23, 24, 27-30, 33-39, 41-44 and 47-58 are patentable over the combination of the '749 patent and Choi. Thus, applicants respectfully request that the provisional nonstatutory obviousness-type double patenting rejection of claims 2, 7, 11, 13, 15, 17-20, 23, 24, 27-30, 33-39, 41-44 and 47-58 be withdrawn, and request that claims 2, 7, 11, 13, 15, 17-20, 23, 24, 27-30, 33-39, 41-44 and 47-58 be allowed at this time.

CONCLUSION

In light of and upon entry of the above amendments and remarks, it is respectfully submitted that the present application is now in proper condition for allowance, and an early notice to such effect is earnestly solicited.

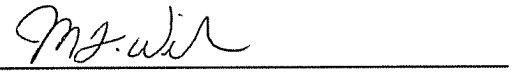
If any small matter should remain outstanding after the Patent Examiner has had an opportunity to review the above Remarks, the Patent Examiner is respectfully requested to telephone the undersigned patent attorney in order to resolve these matters and avoid the issuance of another Official Action.

DEPOSIT ACCOUNT

The Commissioner is hereby authorized to charge any fees associated with the filing of this correspondence to Deposit Account No. **50-0426**.

Respectfully submitted,

JENKINS, WILSON, TAYLOR & HUNT, P.A.

Date: June 16, 2008 By: 

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